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## VEIN QUARTZ IN VIRGINIA

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### INTRODUCTION

Vein quartz is usually in lenticular bodies that may be of sufficient size and quality to be economical. Vein quartz, with a more or less regular development in length and width, usually lies within boundaries clearly separating it from surrounding rock. Deposited from ascending hot waters or from reheating and remobilization, vein quartz usually shows little evidence of significant replacement of wall rock (Howard and Stone, 1988). Vein quartz is usually milky white, a hard durable mineral, has a hardness of seven, and exhibits considerable resistance to weathering. The composition of pure quartz is always close to 100 percent  $\text{SiO}_2$ , however there usually is some iron-oxide and/or manganese staining. It is insoluble in all acids except hydrofluoric.

Many milky vein "bull" quartz deposits have been mined in the past in a wide belt, mainly through the Piedmont province in the Commonwealth (Figure 1). The quartz has been quarried for use as a flux in steel furnaces, and has been marketed as exposed aggregate material used in cast concrete products and as a decorative ground cover stone around rose bushes, etc. One of the most successful companies active in the early to mid-1960s, was Stone and Mineral Corporation. Stone and Mineral Corporation operated a crushing plant and storage yard off the west side of State Road 670, about 0.75 mile southeast of Syria, in north-central Madison County. The company quarried vein quartz from a number of quarries in central Virginia and trucked the quartz to this plant for processing into sized material for exposed aggregate. In January, 1965, the company was sold, however crushing continued at the plant

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|-------------------------|----------------------------|
| 1. Carters Bridge vein  | 12. Horner Quarry          |
| 2. Dabney Quarry        | 13. Davis Quarry           |
| 3. Hickory Ridge Quarry | 14. Haden Quarry           |
| 4. O'Neil property      | 15. Palmyra Stone Co.      |
| 5. Winfree property     | 16. Perkins Quarry         |
| 6. Lowry vein           | 17. Turner Creek Road vein |
| 7. Simms Quarry         | 18. Wirtz Quarry           |
| 8. Central Stone Co.    | 19. Greene Quarry          |
| 9. Hancock Quarry       | 20. Elder Carroll vein     |
| 10. Otter River vein    | 21. Flint Hill vein        |
| 11. Cornwell Quarry     |                            |

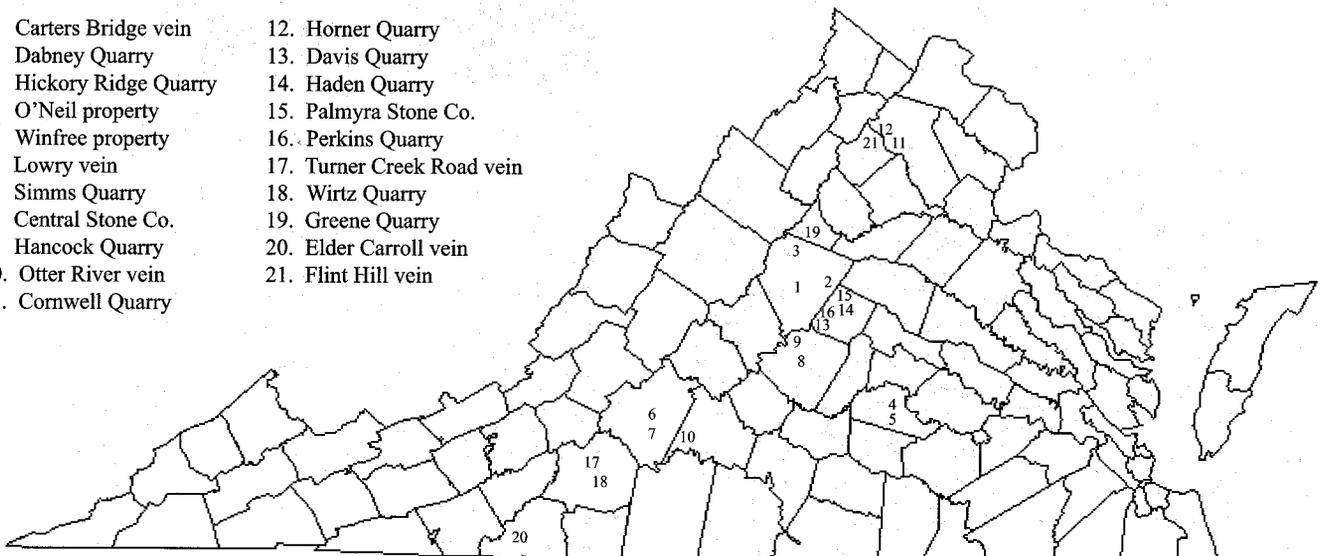


Figure 1. Inactive vein quartz quarries and potential mining sites.



Figure 2. Stockpiles of crushed vein quartz, at the plant of Stone and Mineral Corporation, near Syria, Madison County (circa 1983).

through 1968. Sales from the stockpiles continued into the 1980s (Figure 2). Also active in the 1970s was the Economy Cast Stone Company, which operated two plants in Richmond; one in Glen Allen and one on Belt Boulevard. This company intermittently operated quarries in central Virginia (Albemarle, Bedford, Fluvanna, and Greene Counties), where they quarried vein quartz, and trucked the quartz to their plants in Richmond for processing and use in cast concrete products. In the mid-1980s, mining companies were examining quartz veins and quartz cores in pegmatites in Virginia; exploring for silica with low iron content for metallurgical flux material as well as raw material for optical fibers. The raw material for transmitting light waves along thin silica strands must have the property to withstand thermal stress or nonuniform temperature distribution (Sweet, 1985).

Quartz for some of these uses has been mined at several places in the Commonwealth. Production values for many of the vein-quartz quarry sites in Virginia were available from the former U. S. Bureau of Mines; a company-provided value of \$30/ton was used to indicate a total value of quartz mined per site. The following section contains locations and descriptions of many former vein quartz operations and some potential mining sites.

## INACTIVE QUARRIES AND POTENTIAL MINING SITES

### ALBEMARLE COUNTY

*Carters Bridge ("white whale") vein* located 2.3 miles west of Carters Bridge (Alberene 7.5-minute quadrangle) west of State Road 717, approximately 1.3 miles northeast of its intersection with State Road 712. This large milky, white quartz vein has a strike of N 60° E and is exposed discontinuously for about 0.3 mile with a visible width of 70 feet (Sweet, 1986)(Figure 3). This quartz vein occurs on and approximately parallel to the crest of a northeast-trending ridge, followed in part by the state road. An individual examined the vein in June, 1963 and reportedly offered the landowner 60 cents a ton royalty for the material. The site has not been worked and reserves could be large.



Figure 3. Quartz vein (white whale) west of Carters Bridge, south of Charlottesville, Albemarle County.

*Dabney Quarry* located east of Charlottesville, near Boyd Tavern (Boyd Tavern 7.5-minute quadrangle), north of U. S. Highway 250, just west of the Albemarle-Fluvanna County line. This quarry was operated from January 1964 through December 1966 by the Stone and Mineral Corporation. Production was reported as 1,312 short tons in 1964; 743 short tons in 1965, and 1,419 short tons in 1966. Total production of 3,474 short tons was valued at \$104,220. In 1999, the site had been reclaimed naturally as the quarry and dumps were overgrown with pine trees and the quarry had been filled in from the north. Presently a house occupies the area just northwest of the quarry (Figure 4). The driveway to the house goes through the quarry.



Figure 4. Quarry, with white quartz boulders and house in background, Dabney Quarry, Albemarle County.

*Hickory Ridge Quarry (Maples Quarry)* located about 2 miles east-northeast of Free Union (Free Union 7.5-minute quadrangle), 0.8 mile down Mockernut Lane (Road 1072) northwest of State Road 665, 0.2 mile by road northeast of its intersection with state Road 662. This quarry was opened by the Economy Cast Stone Company and production began on December 1, 1963; the quartz was trucked to their Glen Allen plant in Richmond. This operation continued through July 1971, when quarrying was discontinued. Production was reported as 3,000 short tons in 1965; 5,000 short tons in 1966 and 1967; 3,600 short tons in 1968; 5,000 short tons in 1969 and 1970, and 1,650 short tons in 1971. Total production of

28,250 short tons was valued at \$847,500. In 1999, the quarry was almost inaccessible, it is overgrown with up to 16-inch sycamore trees and underbrush. The quartz vein is exposed in the southeast end of the quarry (Figure 5).



Figure 5. Exposed white quartz vein in the southeast wall of overgrown quarry, Maples Quarry, Albemarle County.

#### AMELIA COUNTY

*O'Neil (O'Neal) beryl prospect property* located 3.5 miles east of Amelia Court House (Amelia Court House 7.5-minute quadrangle), 1.05 miles northeast of State Road 627, 1.25 miles by road north of its intersection with Virginia Highway 38. This site was reported to have been worked from 1962 through 1966 by the Stone and Mineral Corporation. Total production was reported as 96 short tons in 1962 and 16 short tons in 1963; the total of 112 short tons was valued at \$3,360. In December, 1998, the area was planted in pines, however several trench cuts are present. The vein is exposed in the southeast side of one of the trenches. Piles of white milky quartz are present around all the trenches (Figure 6).



Figure 6. Piles of vein quartz near trench-cut of O'Neil beryl prospect, east of Amelia Court House, Amelia County.

*Winfree property* located about 3.2 miles southeast of Amelia Court House (Amelia Court House 7.5-minute quadrangle), 0.2 mile west of State Road 627, 0.7 mile by road north of its intersection with State Highway 38. This site was reported to have been worked from 1962 through 1966 by the Stone and Mineral Corporation; total production is reported only in 1962 as 32 short tons, valued at \$960.

In December, 1998, the quartz vein was exposed in the north-northwest wall of the open pit (Figure 7). The quartz in the deposit is of excellent quality, being clear to milky in color. The quarry site is very accessible, but the surrounding area is overgrown with pine trees and underbrush.

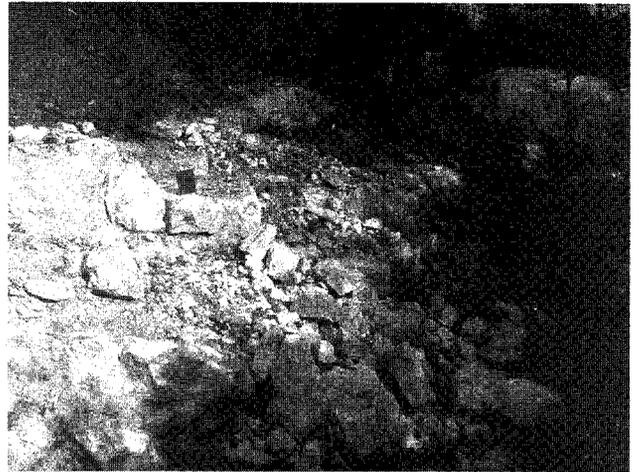


Figure 7. Exposure of vein quartz in north-northwest wall of the Winfree Property, Amelia County.

#### BEDFORD COUNTY

*Lowry quartz vein* located just southeast of Lowry (Goode 7.5-minute quadrangle), adjacent to the Big Otter River. This site was worked in the late 1960s. The operator quarried and crushed the milky-white quartz on-site; material was marketed for exposed aggregate to the Economy Cast Stone Company in Richmond and some was sold to Virginia Polytechnic Institute and State University in Blacksburg. In the Fall of 1998, the area was overgrown, however part of the vein is visible in the hillside and it appears to extend to the west (Figure 8).



Figure 8. Lowry white quartz vein, exposed in the hillside, Bedford County.

On the same property, just to the north, is another quartz vein that appears to be cleaner and may extend over a larger area. The vein has been pit-prospected on the eastern end and a 22-foot drill hole was drilled in the vein in the past.

*Simms (Sims) Quarry* located about 4 miles south of Goode (Goode 7.5-minute quadrangle), north of State Road 818 (Egypt Road), approximately 0.5 mile west of its intersection with State Road 708 (Pisgah Road). The quarry was worked by the Stone and Mineral Corporation; production from the site was reported as 72 short tons in 1962 and 22 short tons in 1963. Total production of 94 short tons from this quarry was valued at \$2,820. In October, 1998, the quarry had been filled in, reclaimed, and grassed over. A lot of the milky white quartz has been piled up as a retaining wall for a drainage that runs into the Big Otter River (Figure 9). The quartz vein is exposed in the northeast creek bank in the hornblende schist country rock.

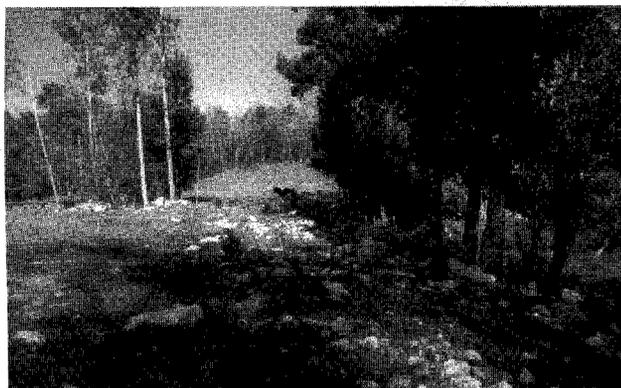


Figure 9. Piles of vein quartz around the reclaimed site of the former Simms Quarry, Bedford County.

#### BUCKINGHAM COUNTY

*Central Stone Company* located about 2 miles northwest of Diana Mills (Diana Mills 7.5-minute quadrangle), east of State Road 721. The quarry was operated from about 1965 until August 1967. Most of the quartz was marketed to Early Studios in Manassas. In the late 1960s the quarry site was filled in and grassed over.

*Hancock Quarry* located 3.5 miles south of Scottsville (Scottsville 7.5-minute quadrangle), south of State Road 695, approximately 0.75 mile southwest of its intersection with State Highway 20. The quarry was worked from 1967 through 1969 by the Stone and Mineral Corporation. Production from this quarry was reported as 192 short tons in 1967; 250 short tons in 1968, and 200 short tons in 1969; the total of 642 short tons were valued at \$19,260. In the 1980s the quarry was overgrown with small trees (Figure 10).

#### CAMPBELL COUNTY

*Otter River quartz vein* located about 3.25 miles south of Evington (Lynch Station 7.5-minute quadrangle), about

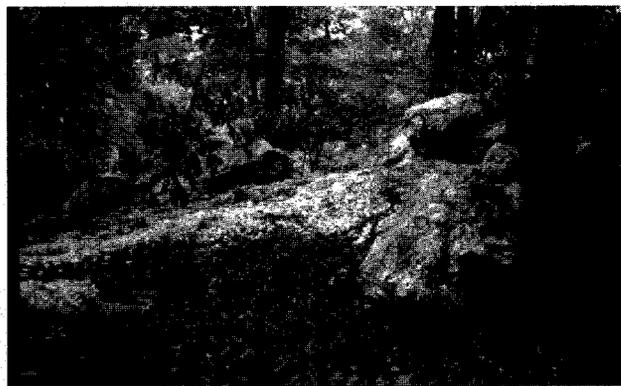


Figure 10. White vein quartz in the Hancock Quarry, Buckingham County.

0.3 mile northeast of the intersection of State Roads 626 and 711. The white quartz vein appears to have minimum dimensions of 0.4 mile long, 100 feet wide, and 150 feet thick; 2.6 million short tons are estimated to be in the deposit (Sweet, 1986). The vein is well exposed in the hillside to the south and in the bed of the Otter River (Figures 11 & 12). A company was interested in the deposit for a metallurgical flux in the early 1980s, however negotiations were terminated due to market conditions.



Figures 11 & 12. Otter River quartz vein exposed in the hillside and in the bed of the Otter River, Campbell County.

#### FAUQUIER COUNTY

*Cornwell (Carnwell) Quarry* located about 0.5 mile south of Orlean (Jeffersonton 7.5-minute quadrangle), east of State Road 688 (Leeds Manor Road). Two quartz veins

were quarried on this site from 1963 through 1968 by Stone and Mineral Corporation. Production was reported only in 1966 as 200 short tons, valued at \$6,000. These quarry sites have been filled in and only scattered pieces of milky quartz and parts of the vein remain exposed in the area. In March 1999, houses had been built on each of the former quarry sites; the white quartz vein is exposed in front of one of the houses (Figure 13).



Figure 13. White quartz vein exposed in front of a house, Cornwell Quarry, Fauquier County.

*Horner (Harner) Quarry* located about 4 miles east of Flint Hill (Flint Hill 7.5-minute quadrangle), just east of the Rappahannock River, south of State Road 647, on the Beaumont Farm. This quarry was operated from 1962 through 1966 by the Stone and Mineral Corporation. Production from this site was reported in 1962 as 827 short tons; 560 short tons in 1963, and 138 short tons in 1964; total production of 1,525 short tons was valued at \$45,750. In March 1999, the quarry site was filled in and a grove of trees had grown up in the area; pieces of milky white and smoky quartz were observed to cover the surface. Boulder-size pieces of milky white quartz were scattered down the hillside (Figure 14).

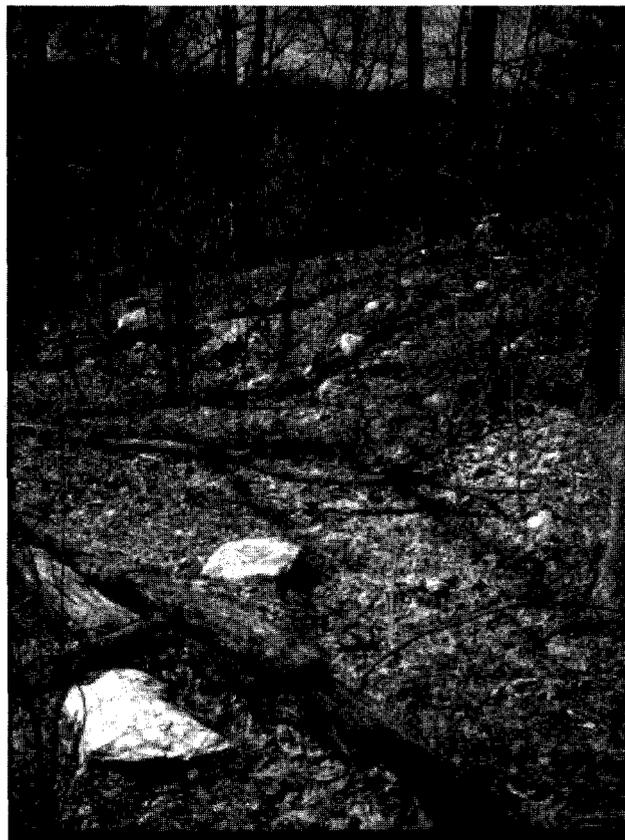


Figure 14. Milky white quartz on the hillside, Horner Quarry, Fauquier County.

#### FLUVANNA COUNTY

*Davis (Branch-Davis) Quarry* located about 1.5 miles east of downtown Scottsville (Scottsville 7.5-minute quadrangle), 150 feet south of State Highway 6. According to a C. S. Turner memorandum, dated September 19, 1942, the quartz outcrop covers about 700 acres. The property was core drilled by Baldwin in 1925; an analysis by Froehling and Robertson indicated 99.9 % SiO<sub>2</sub>. Electro Metallurgical Company of Niagara Falls, New York analyzed the quartz and noted that it contained 98.39 % SiO<sub>2</sub>. In June 1942, C. S. Turner analyzed the quartz and reported it to have 98.99 % SiO<sub>2</sub>.

The Stone and Mineral Corporation started quarrying at this site on October 23, 1961 (the quarry had been worked for highway aggregate in the 1920s). The quarry was worked through August 1966 (Figure 15). Production from this quarry was reported to be 2,461 short tons in 1962; 3,531 short tons in 1963; 1,553 short tons in 1964; 2,311 short tons in 1965, and 1,608 short tons in 1966. Total production of 11,464 short



Figure 15. Active operation of Stone and Mineral Corporation, Davis Quarry, east of Scottsville, Fluvanna County (Photograph from the Daily Progress Newspaper, August 28, 1965).

tons was valued at \$343,920. In March 1999, the quarry was overgrown with trees and underbrush and partly filled with construction and other debris (Figure 16).



Figure 16. Abandoned, overgrown quartz vein quarry, Davis Quarry, Fluvanna County.

*Haden Quarry* located 0.5 mile north of Nahor (Boyd Tavern 7.5-minute quadrangle), west of State Road 636. The Stone and Mineral Corporation produced quartz from this quarry from 1962 through 1969; production from this quarry was reported to be 6 short tons in 1962; 1,678 short tons in 1963; 311 short tons in 1964; 111 short tons in 1965; 135 short tons in 1966; 1,038 short tons in 1967; 250 short tons in 1968, and 200 short tons in 1968. Total production of 3,729 short tons was valued at \$111,870. In March 1999, the entrance to the quarry was being utilized as a site for storage of construction materials. In 1999, the quarry was overgrown with trees and underbrush and has been partially filled with fallen trees, which have been pushed in from the east (Figure 17).



Figure 17. White quartz vein overgrown with trees and underbrush, Haden Quarry, Fluvanna County.

*Palmyra Stone Company* located about 2 miles southeast of Boyd Tavern (Boyd Tavern 7.5-minute quadrangle), north of State Road 616. In 1964, the company estimated reserves to be 500,000 short tons, valued at \$38.00 per ton. Sweet (1986) notes that this quarry was active in 1964 and estimates quartz reserves to be closer to a million short tons (Figure 18). The owner of the company noted in February 1964 that he had an order for 500 tons of quartz from Early Studios in Manassas, and also an order from Ohio for 800 tons of crushed quartz; at the time he said the company did not have the capacity to fill these orders. The vein has a strike of N 15° W and a steep southwest dip; the vein appears to continue to the

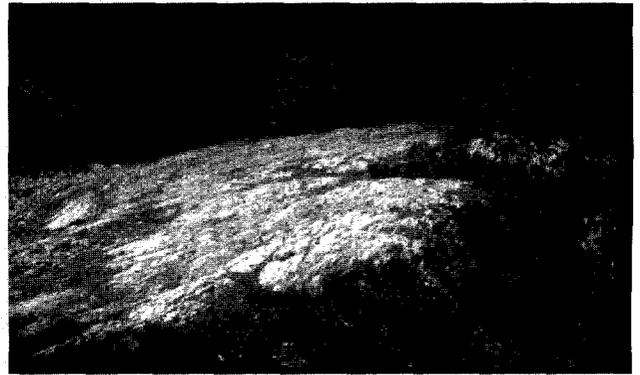
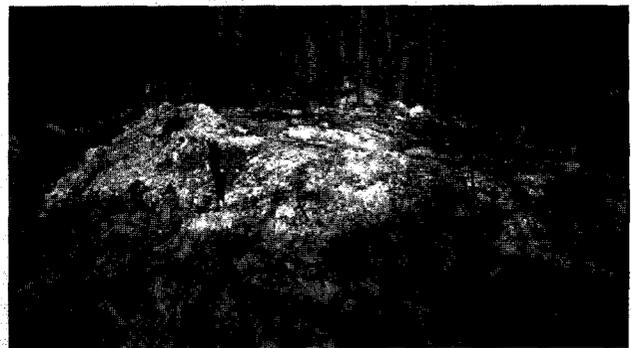


Figure 18. White vein quartz at quarry of Palmyra Stone Company, Fluvanna County.

southeast. Sweet (1985) also notes the silica content to be 99.05%, with 0.00% Fe<sub>2</sub>O<sub>3</sub>, and 0.66% Al<sub>2</sub>O<sub>3</sub>.

*Perkins Quarry* located 3.25 miles west of Cunningham (Simeon 7.5-minute quadrangle), north of State Road 619, approximately 2.1 miles east of the Fluvanna-Albemarle County line. The quarry was operated by the Stone and Mineral Corporation in October 1964; in early 1965, the quarry was acquired by the Economy Cast Stone Company. Production was reported only in 1964 as 138 short tons, valued at \$4,140. In March 1999, the quarry was fairly open with only some small pine trees growing within the quarry. A dump of 2-inch size white quartz is present off the northwest edge of the quarry; the quartz vein is exposed in the east-northeast end of the quarry (Figures 19 & 20).



Figures 19 & 20. Crushed white quartz dump to the northwest and exposed vein in the east-northeast wall of the Perkins Quarry, Fluvanna County.

## FRANKLIN COUNTY

*Turners Creek quartz vein* located 5.3 miles northwest of Ferrum (Ferrum 7.5-minute quadrangle), northeast of State Road 748 (Turners Creek Road) at its intersection with State Road 788 (Buffalo Ridge Road). The milky-white quartz vein appears to be at least 300 feet wide and extends for about 0.3 mile in a south to northeast trend along the ridge (Figure 21). The potential reserves of this quartz vein could be very large.



Figure 21. Hillside milky white quartz vein located off Turners Creek Road, Franklin County.

*Wirtz quartz vein* located in Franklin County, 0.8 mile south of Wirtz (Boones Mill 7.5-minute quadrangle), off the north side of State Road 775 (Iron Ridge Road), 0.2 mile southwest of its intersection with U. S. Highway 220. In February 1942, the Carrollton Corporation of New York leased a seven-acre tract of land to mine vein quartz. At that time, a steam shovel, air drills, and a rock crusher were moved to the site to produce metallurgical-grade rock, probably to be shipped north by rail that was available near the site (Figure 22). The crushed quartz was probably marketed as a metallurgical flux material to be used in the steel industry. According to a local resident, the material ran out and the operation shut down. It was reported that the product was to be used to "clean gun barrels" (A.



Figure 22. Steam shovel at work, on quartz vein, by the Carrollton Corporation of New York, near Wirtz, Franklin County (Photograph from the Roanoke Times newspaper, February 5, 1942).

McBride, 1998, personal communication). In the Fall of 1998, the vein was exposed in the roadside hillside and large boulders were present around the abandoned pit area (Figure 23). The old quarry site is overgrown with trees and underbrush and is backfilled from the northeast.



Figure 23. Abandoned vein-quartz quarry site, located near Wirtz, Franklin County.

## GREENE COUNTY

*Greene Quarry* located 2.2 miles northwest of the Albemarle-Greene County line (Earlsville 7.5-minute quadrangle), west of State Road 604, 0.2 mile north of its intersection with State Road 648. The Economy Cast Stone Company opened this quarry in July 1973; several truckloads of vein quartz from this quarry were trucked to Richmond until the operation closed in late 1975. In March 1999, the area was overgrown with pine trees. Some large boulders of white quartz remain in the bottom of the quarry. White quartz is exposed in the north wall of the quarry (Figure 24).



Figure 24. White quartz vein in the north wall of the abandoned quarry, Economy Cast Stone Quarry, Greene County.

## PATRICK COUNTY

*Elder Carroll quartz vein* located about 4.5 miles southwest of Meadows of Dan (Meadows of Dan 7.5-minute quadrangle), 0.5 mile southwest from the end of State Road

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606. This site was quarried by D. & K. Construction Company of Ohio in 1962 through November 1963; metallurgical-grade quartz was quarried and trucked to market in Pittsburgh, PA. Reportedly a crusher was on site and the crushed product was marketed as an exposed aggregate that was glued on plywood for the construction industry. A royalty of \$1.00/ton was paid for the quartz. The quartz vein (strike of N 35° E and a dip of 60° SE) is exposed for about 400 feet, with a width of 75 feet; soil cover is over an additional 900 feet of vein material to the northeast (Sweet, 1986) (Figure 25). An analysis of the quartz, performed in the early 1980s, indicates 99.10% SiO<sub>2</sub>, 0.00 % Fe<sub>2</sub>O<sub>3</sub> and 0.57% Al<sub>2</sub>O<sub>3</sub> (Virginia Division of Mineral Resources Laboratory). In February 1999, the area was overgrown with trees although the vein remains well exposed.

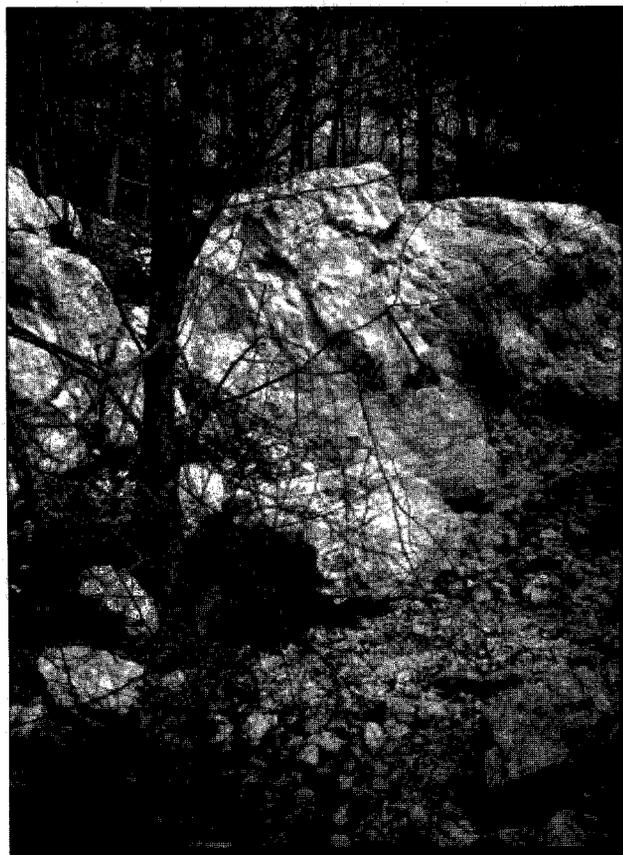


Figure 25. White quartz vein, formerly operated by D. & K. Construction Company of Ohio, Meadows of Dan, Patrick County (circa 1984).

## RAPPAHANNOCK COUNTY

*Flint Hill quartz vein prospect* located 0.6 mile north of Flint Hill (Flint Hill 7.5-minute quadrangle), east of U. S. Highway 522. This white quartz vein was reported to have been leased by Stone and Mineral Corporation and prospected. In March 1999, there was some crushed quartz in the entrance road, indicating some small production. The prospect is about 15 feet in diameter and contains some quartz boulders. The vein is clearly exposed in the roadcut, to the southwest, along U. S. Highway 522 (Figure 26).



Figure 26. Quartz vein, in roadcut on U. S. Highway 522, just north of Flint Hill, Rappahannock County.

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